

A collection of short problems on place value, integers, ordering and rounding.

Q1.

A 4 by 4 "anti-magic square" is an arrangement of the numbers 1 to 16 inclusive in a square, so that the totals of each of the four rows and four columns and two main diagonals are ten consecutive numbers in some order. The diagram shows an incomplete magic square. Can you complete it?

4	5	7	14
6	13	3	
11	12	9	
10			

<http://nrich.maths.org/2210>

Q2.

The pattern 123451234512345... is continued to form a 2000 digit number. What is the sum of all 2000 digits?

<http://nrich.maths.org/2344>

Q3.

In how many whole numbers between 100 and 999 is the middle digit equal to the sum of the other two digits?

<http://nrich.maths.org/2347>

Q4.

If p is a positive integer and q is a negative integer, which of the following is the greatest?

- A. $p-q$
- B. $q-p$
- C. $p+q$
- D. $-p-q$
- E. More information needed

<http://nrich.maths.org/5762>

Q5.

On the given diagram, how many squares, of any size, are there whose entries add up to an even total?

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25

(<http://nrich.maths.org/5772>)

Q6.

In a magic square, the three numbers in each row, in each column, and in each diagonal add up to the same number. Complete this magic square.

13		
	10	
9		7

Q7.

Bilbo and Frodo have just consumed a plateful of cherries. Each repeats the rhyme 'Tinker, tailor, soldier, sailor, rich man, poor man, beggar man, thief' over and over again as he runs through his own heap of cherry stones. Bilbo finishes on 'sailor', whereas Frodo finishes on 'poor man'. What would they have finished on if they had run through both heaps together?

(<http://nrich.maths.org/6229>)

Q8.

Tony owes Tina €0.40. Then Tina borrows €0.5 from Tony. Later Tony gives Tina €0.60. Who has to pay what to whom to square things up?

(<http://nrich.maths.org/6234>)

Q9.

In how many ways can you give change for a ten cent piece?

(<http://nrich.maths.org/6238>)

Q.10

Here are the dates of pivotal female three mathematicians: [Sophie Germain](#) (French) 1776-1831, [Sonja Kowalevsky](#) (Russian) 1850-91, [Emmy Noether](#) (German) 1882-1935.

Arrange them in order with the shortest-lived first.

(<http://nrich.maths.org/6244>)

Q11.

Nine bus stops are equally spaced along a bus route. The distance from the first to the third is 600m. How far is it from the first to the last?

(<http://nrich.maths.org/6246>)

Q.12

A quiz has twenty questions with seven points awarded for each correct answer, two points deducted for each wrong answer and zero for each question omitted. Jack scores 87 points. How many questions did he omit?

<http://nrich.maths.org/6255>

Q.13

I have a max/min thermometer in my greenhouse. It records both the highest and the lowest temperatures reached from the time I reset it. I reset it on Sunday when the temperature was 4°C. Overnight the temperature fell 5°. Then during Monday it rose by 6° before falling 10° during the night. On Tuesday it rose by 4° and fell by 2° overnight. On Wednesday evening, what were the maximum and minimum temperatures recorded?

<http://nrich.maths.org/6262>

Q.14

Gar the Magician wrote each of the numbers from 1 to 7, one on each of seven cards, and placed them in his hat. He offered the hat to two other magicians, Kan and Roo. Kan took, at random, 3 cards from the hat and Roo took 2 cards (so that there were 2 cards left in the hat). Kan told Roo: "I can deduce that the sum of the numbers of your cards is even". What was the sum of the numbers on Kan's cards?

<http://nrich.maths.org/6753>

Q.15

What is the smallest number of letters that need to be removed from the word DISCOVER so that the remaining letters are in alphabetical order?

<http://nrich.maths.org/6768>

Q.16

What number is half way between $\frac{4}{5}$ and $\frac{-2}{3}$?

<http://nrich.maths.org/6787>

Q.17

The product of four different positive integers is 100. What is the sum of these four integers?

(<http://nrich.maths.org/7132>)

Q.18

The digits of Alberta's age are interchanged and 1 is added. The answer is half of Alberta's present age. How old is Alberta?